APR 24 1979

IPP

200

INTERMOUNTAIN POWER PROJECT
P.O. Box 88
Sandy, Utah • 84070
Telephone (801) 566-3608

JF

April 13, 1979

Mr. Jim Rakers
Air Branch, Technical
United States Environmental
Protection Agency
Region VIII
1860 Lincoln Street
Denver, Colorado 80295

Dear Mr. Rakers:

Intermountain Power Project (IPP) - Lynndyl Site
Notice of Intent to Construct (NOI)
Additional Information

As discussed with you by Messrs. J. A. Avalos and B. Campbell on their February 27, 1979 visit to your office to review the status of the IPP NOI permit application, the project has, based on recent geological studies, revised the site plan for the Lynndyl site by relocating the generating station approximately 1800 feet (570 meters) east-southeast of the former location. The revised site layout is shown on the enclosed copy of Figure AL5, Site Plan, Revision 2, dated February 7, 1979.

We have discussed this site plan revision with Mr. J. F. Bowers, H. E. Cramer Co., Inc., project air quality consultant. Mr. Bowers' assessment is that the modification of the site layout does not alter any of the conclusions contained in their August 1978 air quality and visibility impact reports for the original Lynndyl site. The new site layout shifts the concentration isopleth patterns about 570 meters to the east-southeast. Therefore, it is the opinion of Mr. Bowers that with this exception, no changes are required in the air quality and visibility impact analyses provided in the August 1978 reports.

April 13, 1979

If we can be of assistance to you in any area relative to the NOI permit application processing, please contact Mr. Avalos at (213) 481-4672.

Sincerely,

James H. Anthony

JAMES H. ANTHONY
Project Engineer
Intermountain Power Project

JAA:bc
Enclosure

cc: Mr. J. F. Bowers w/Encl.
H. E. Cramer Co., Inc.
P. O. Box 8049
Salt Lake City, Utah 84108

Mr. J. A. Avalos w/Encl.
Mr. B. Campbell

bcc: IPP/IPA Board
H. L. Holland
R. E. Bradley
J. H. Anthony/File w/Encl.
W. W. Pepper

250

IPP

APR 16 1979

INTERMOUNTAIN POWER PROJECT
P. O. Box BB
Sandy, Utah · 84070
Telephone 801/255-2903

April 12, 1979

Mr. Alvin E. Rickers, Director
Bureau of Air Quality
State of Utah
Division of Health
150 West North Temple
Salt Lake City, Utah 84111

Dear Mr. Rickers:

Intermountain Power Project (IPP) - Lynndyl Site
Notice of Intent to Construct (NOI)

This will acknowledge the visit to your office by Messrs. J. A. Avalos and B. Campbell on February 26, 1979, to discuss the status of the IPP permit application. During this discussion, you suggested that IPP request in writing the verification of predicted concentrations from your preliminary modeling of the estimated plant emissions. Your letter of October 30, 1978, indicated that this preliminary diffusion modeling effort led your office to conclude that the proposed construction of a 3000-megawatt coal-fired electric generating plant near Lynndyl is feasible from an air quality viewpoint.

It is our understanding that your office no longer provides "concept approval" of proposed projects. However, in an effort to ascertain that this project is feasible and in compliance with all applicable State and Federal air quality regulations, we hereby request that your office formally report to us the resultant concentrations and impacts of your air quality analysis of the proposed project at the Lynndyl site. We understand that this analysis would be subject to reverification when additional base-line meteorological data from the meteorological tower installed by your office in the proximity of the plant site has been accumulated.

Additionally, as explained to you by Messrs. Avalos and Campbell during the meeting, because of recent geological studies, the project has revised the site plan for Lynndyl by relocating the plant stacks approximately 1800 feet (570 meters) east-southeast

of the former location. I have enclosed for your information a copy of Figure AL5, Revision 2, dated February 7, 1979. In discussions held with Mr. Jim Bowers of the H. E. Cramer Co., Inc., the project's air quality consultant, he has assessed that the modification of the site layout does not alter any of the conclusions contained in their August 1978 air quality and visibility impact reports for the original Lynndyl site. The new site layout shifts the concentration isopleth patterns about 570 meters to the east-southeast. However, Mr. Bowers feels that with this exception, no changes are required in the air quality and visibility impact analyses provided in the August 1978 reports.

If we can be of assistance to you in this effort or in any area relative to the permit application, please contact Mr. Avalos at (213) 481-4672.

Sincerely,

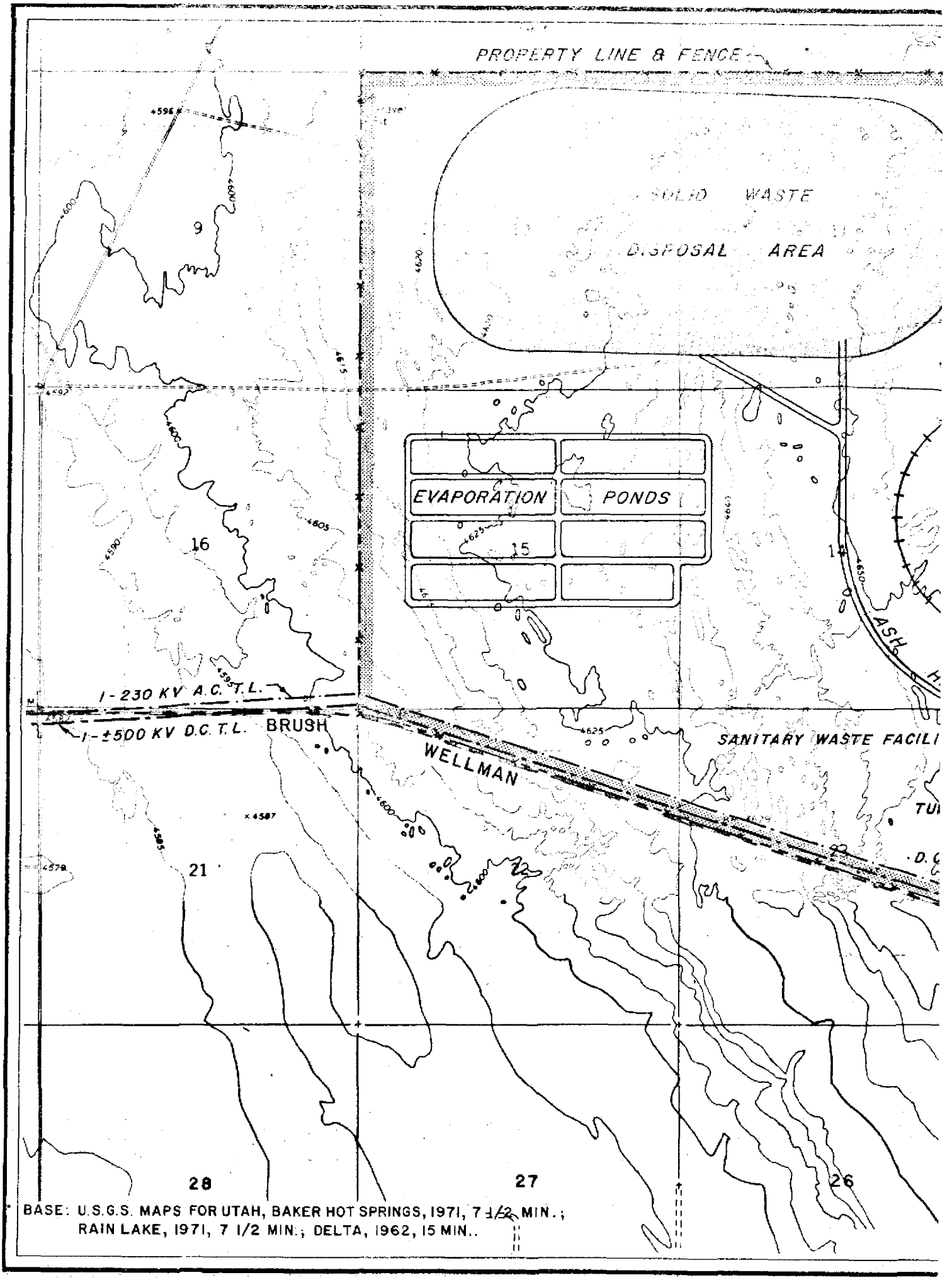
James H. Anthony

JAMES H. ANTHONY
Project Engineer
Intermountain Power Project

JAA:hs/pt
Enclosure

cc: Mr. J. Bowers
H. E. Cramer Co., Inc.
P. O. Box 8049
Salt Lake City, Utah 84108

Mr. J. A. Avalos
Mr. B. Campbell



BASE: U.S.G.S. MAPS FOR UTAH, BAKER HOT SPRINGS, 1971, 7 1/2 MIN.; RAIN LAKE, 1971, 7 1/2 MIN.; DELTA, 1962, 15 MIN..

REV. 2 2-7-79

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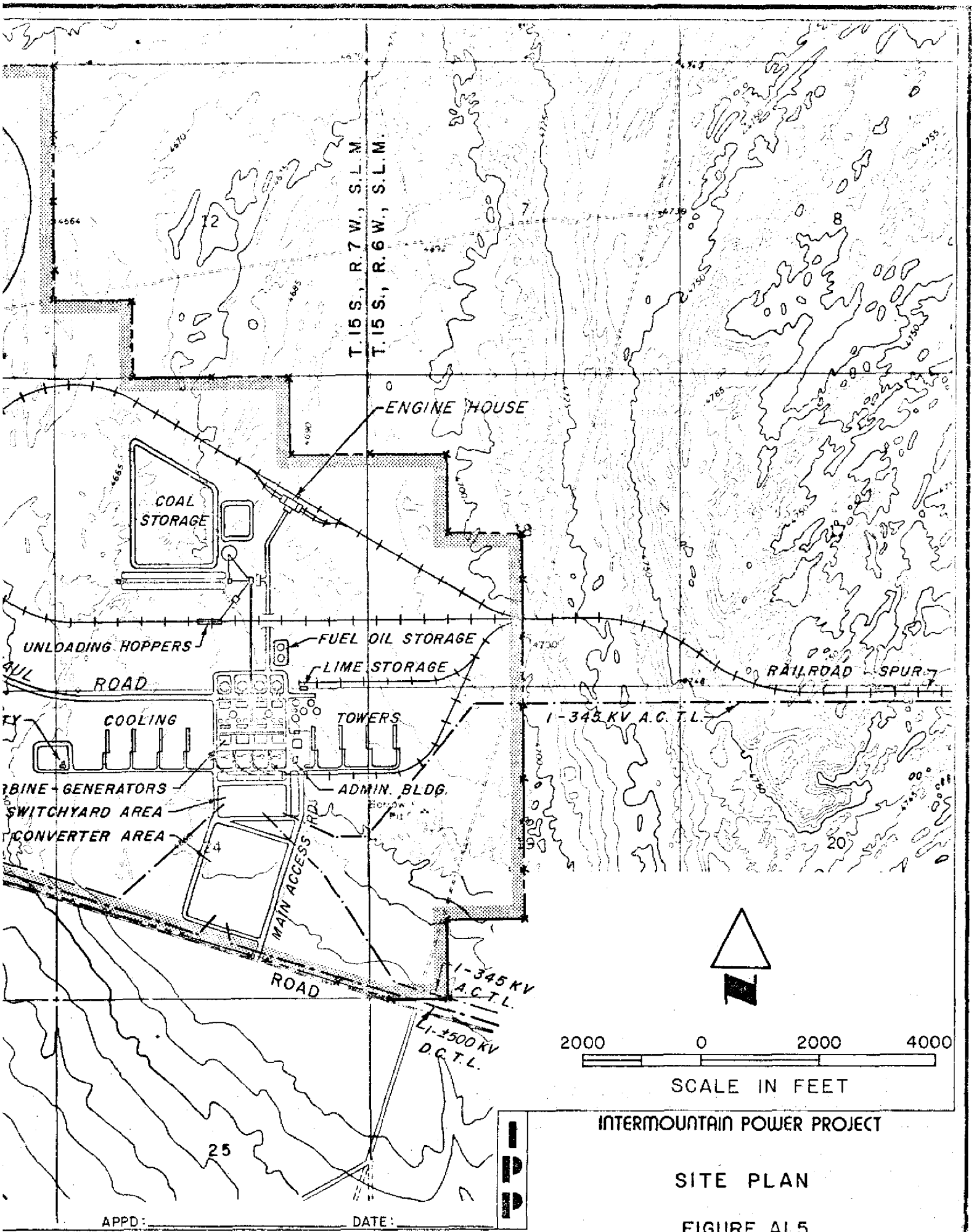

APPD: _____ DATE: _____

INTERMOUNTAIN POWER PROJECT

SITE PLAN

FIGURE AL5

IP10_003587

IPP

INTERMOUNTAIN POWER PROJECT
P.O. Box 88
Sandy, Utah • 84070
Telephone (801) 566-3608

September 26, 1978

Mr. Fred Longenberger
Air Branch, Technical
United States Environmental
Protection Agency
Region VIII
1860 Lincoln Street
Denver, Colorado 80295

Dear Mr. Longenberger:

Intermountain Power Project (IPP) - Lynndyl Site
Notice of Intent to Construct (NOI)
Request for Additional Information

The additional information requested by you via telephone conversation with Messrs. Larry Johnson and John Avalos on August 23, and September 18, 1978, respectively, relative to the NOI filed by IPP at the Lynndyl site is submitted herewith.

As per your conversation with Mr. Avalos on September 18, 1978, the information enclosed on the plant emissions impact on soils and vegetation is that which is contained in the IPP Preliminary Engineering and Feasibility Study, Volume V, Environmental Assessment, for the Salt Wash site, and is generally applicable to the Lynndyl site. This assessment states that since plant emissions are in compliance with the primary and secondary National Ambient Air Quality Standards (NAAQS), which were adopted for the protection of the public health and welfare, the impact on soils and vegetation is negligible.

The H. E. Cramer Co., Inc., air quality consultant to IPP for the Lynndyl site, further supports this prior assessment at the Salt Wash site as their modeling studies of the air quality impact from the plant emissions show the maximum short-term and annual average SO2, NO2 and particulate matter concentrations to be below the NAAQS and in compliance with all federal and state standards. The maximum concentrations are projected to occur north to northeast of the plant site. The nearest area to the plant site which contains "commercial value" vegetation is the agricultural land located approximately three miles southwest of the proposed plant site.

A draft report by the H. E. Cramer Co., Inc., of the plant emissions impact on visibility, titled "Calculated Visibility Impacts of Emissions from the Proposed IPP Power Plant at the Lynndyl Site" was transmitted to Mr. Don Henderson of your office on September 7, 1978.

It is assumed that the normal work-day operating force during the plant operation will involve an average of 475 people, utilizing 365 cars (based on average of 1.3 people per car). The average one-way drive will be approximately eleven miles. It is expected that there will be 10 to 11 truck deliveries per day for miscellaneous materials and supplies (excluding coal and lime) during the operation of the plant. Depending on the final detailed design of the ash disposal system, size of trucks, conveyors, etc., there could be as many as 100 truck-trips per day transporting material two miles to the waste disposal site.

If we can be of further help or you desire additional information relative to this NOI, please call John Avalos at (213) 481-4672.

Sincerely,

James H. Anthony

JAMES H. ANTHONY
Project Engineer
Intermountain Power Project

JAA:nf
Enclosure
cc: H. E. Cramer Co., Inc. w/Encl.

bcc: IPP Board w/Encl.
H. L. Holland "
R. E. Bradley "
J. H. Anthony/File "
L. E. Johnson "
F. Kohno "
W. W. Pepper "
J. A. Avalos "

There should be no significant impacts to the rare plants occurring within the region as a result of power plant construction and operation.

Sulfur dioxide and nitrogen oxides are the primary gaseous emissions expected from the IPP power plant. As shown in Section 3.1.4, the proposed power plant is expected to meet state and federal emission standards and also ambient air quality standards, including the Class II significant deterioration increment. Primary ambient standards are designed to protect vegetation, wildlife and domestic animals. With these standards being met, the assumption can be made that little or no impact will result to vegetation, wildlife, domestic animals or humans from emissions from the power plant.

Many studies of the effects of common gaseous effluents on various biota have been performed under artificial greenhouse conditions rather than with plants growing in the field. Often these studies may indicate greater damage (conservative estimate of threshhold levels) than would occur under natural conditions because of greater humidity and uneven fumigation.

SULFUR DIOXIDE

Neither short- nor long-term exposures of expected SO_2 concentrations from the power plant are expected to produce significant effects on vegetation, wildlife, humans or domestic animals. The highest calculated ground level average SO_2 value is 578 $\mu g/m^3$ which could occur over a 3-hour period and under worst conditions at 10.0 km north of the power plant (Section 3.1.4). This represents the highest short-term condition. The maximum long-term concentration will be about 5.6 $\mu g/m^3$ and will occur at 8.0 km due north of the plant. Short-term concentrations demonstrated to cause damage to local species are shown in Table 3.1.2-1.

A recent EPA literature review concerning factors affecting the sensitivity of a plant to sulfur dioxide indicates that plants grown under conditions of low soil moisture and low humidity are less susceptible to sulfur dioxide damage than those grown under moist conditions.[2] Such a low soil moisture and low humidity condition is characteristic of south-central Utah.

Long-term effluent effects of sulfur dioxide will be reduced by air mass movements, precipitation and by active sorption of SO_2

TABLE 3.1.2-1

PERCENTAGE OF THE TOTAL LEAF AREA INJURED BY SO_2 DURING 2-HOUR FIELD FUMIGATION STUDIES IN NORTHWESTERN NEW MEXICO FOR SPECIES WHICH OCCUR IN THIS REGION[1]

Species	Average % Leaf Area* Injured/2-hr Concentration of SO_2			Number of Replications		
	1300 $\mu g/m^3$	2600 $\mu g/m^3$	5200 $\mu g/m^3$	1300 $\mu g/m^3$	2600 $\mu g/m^3$	5200 $\mu g/m^3$
Abies concolor (White fir)		0			1	
Amelanchier utahensis (Utah serviceberry)	0	0.2	3	1	3	3
Artemisia tridentata (Big sagebrush)			0			2
Astragalus utahensis (Locoweed)		2	0		1	1
Atriplex canescens (Fourwing saltbush)						
Atriplex confertifolia (Shadscale)						
Cercocarpus montanus (Mountain mahogany)						
Chrysothamnus nauseosus (Big rubber rabbit-brush)						
Chrysothamnus viscidiflorus (Sticky-flower rabbitbrush)		0			2	
Ephedra viridis (Mormon tea)		0			2	
Eriogonum racemosum (Buckwheat)		0			1	
Eurotia lanata (Winterfat)						

(Continued)

TABLE 3.1.2-1 (Continued)

Species	Average % Leaf Area* Injured/2-hr Concentration of SO_2			Number of Replications		
	1300 µg/m³	2600 µg/m³	5200 µg/m³	1300 µg/m³	2600 µg/m³	5200 µg/m³
Gutierrezia sarothrae (Snakeweed)			0			4
Juniperus osteosperma (Utah juniper)						
Opuntia sp. (Prickly pear cactus)						
Oryzopsis hymenoides (Indian ricegrass)	0.2	2	2	4	9	8
Picea pungens (Blue spruce)			0			1
Pinus edulis (Pinyon pine)						
Pinus ponderosa (Ponderosa pine)						
Populus angustifolia (Narrowleaf cotton-wood)	0	0	2	3	6	2
Populus tremuloides (Quaking aspen)	0	0	0	1	2	3
Pseudotsuga taxifolia (Douglas fir)						
Quercus gambelii (Gambel oak)						
Rhus trilobata (Squawbush)						
Salsola kali (Russian thistle)						

* Species for which no values are reported showed no or only slight damage at concentrations much higher than those shown in this table.

by soil and suspended particulate matter.[3] Sulfur dioxide sorption by soils was found to be independent of biota present, pH, organic matter content and particle sizes, but was greater for moist than for dry soil.[4]

High concentrations of SO_2 are necessary to pose a threat to animal life. Several studies have shown that exposure of laboratory animals to more than 13,000 $\mu g/m^3$ for periods of up to 78 weeks produced no adverse effects.[1] A 20-minute exposure to 13,000 $\mu g/m^3$ of sulfur dioxide produced no permanent effects in ten guinea pigs although temporary breathing difficulty (increased resistance to respiration air flow) was observed.[5]

Sulfur dioxide, after photooxidation to SO_3, can be absorbed by raindrops to form dilute solutions of sulfuric acid.[3,6,7] Atmospheric dust neutralizes atmospheric acids converting them to relatively harmless salts.[8] The low humidity that predominates in the region will tend to minimize the localized conversion of SO_2 emissions to dilute sulfuric acid, while atmospheric dust and the generally alkaline soils and shrub vegetation will neutralize any acid atmospheric moisture on precipitation which might occur. Therefore, no significant adverse effect on soils or biota is expected from conversion of SO_2 from the power plant to acid in the atmosphere.

NITROGEN OXIDES

Neither short- nor long-term exposures to expected nitrogen oxide concentrations from the power plant emissions are expected to produce significant effects in vegetation, wildlife, humans or domestic animals.

The limiting air quality standard for NO_2 in Utah has been established by the EPA and the state of Utah at 100 $\mu g/m^3$ (Section 3.1.4). Oxides of nitrogen, usually referred to as NO_x, result from the reaction of atmospheric nitrogen and oxygen at high temperatures during combustion processes. A common form of NO_x, nitrogen dioxide (NO_2), is considered to be the most toxic of the oxides of nitrogen.[9] The calculated long-term annual average ground level concentration is 40 $\mu g/m^3$ (0.015 ppm), which is 32 percent of the annual allowable standard for NO_2.

Most experimental fumigation experiments causing observable vegetative injury have been conducted with NO_2 concentrations exceeding 0.5 ppm (~ 1300 $\mu g/m^3$).[10,11]

Nitrogen dioxide is readily assimilated by moist soils and oxidized to nitrate, while nitric oxide and nitrous oxide are absorbed by plants. Photooxidation to nitric acid may occur in the atmosphere, and this acid may fall to earth in raindrops.[12] The arid conditions existent in south-central Utah, however, are not conducive to the formation of acid rain.

Chronic effects in animals result from continuous or intermittent exposures to levels of approximately 0.5 ppm, ~~or lower~~. Direct damage to bronchial epithelial cells of mice occurred with continuous exposure of mice to 0.5 ppm NO_2 in the presence of pneumonia bacteria for 3 months resulting in increased mortality.[13] The NO_2 maximum annual level expected near the power plant, operating at 100 percent capacity, would be only 0.015 ppm, therefore no environmental problems are anticipated to occur.

PARTICULATE EMISSIONS

Particulate emissions from the power plant are not expected to have a significant impact on the ecology of the region. Particulate emissions from coal-fired power plants are of concern because of (1) the toxic nature of some trace elements contained in these particulates, (2) respiratory irritation which may result from particulate inhalation and (3) the interaction between gaseous and particulate emissions which may produce effects at concentrations lower than either one acting alone. The basic particulate emissions from the plant are fly ash which consists of minute glassy beads containing numerous trace elements.[14,15] The deposition rates for these elements are given in Section 3.1.4.5. These particles are rather insoluble but over time these elements may leach out. Baseline values for trace element content in soils, vegetation and wildlife of the IPP site are presented in Section 2.1.10 and the impacts associated with trace elements are discussed in Section 3.1.10. As discussed in Section 3.1.4.8, the particulate emissions from the power plant will not increase the total concentration of particulates in the region by a significant quantity.

SYNERGISTIC EFFECTS

Air pollutants may interact with one another producing synergistic effects at concentrations lower than any pollutant acting alone. SO_2 and NO_2 in combination may be synergistic in their ability to cause injury to plants. To determine the effects of coal-fired emissions on native vegetation in the Southwest, fumigation studies of native cold desert plant species were conducted by the University of Utah's Engineering Experiment Station in northwestern New Mexico. Portable chambers were placed over plants in the field and fumigated with SO_2 and with SO_2 and NO_2 in combination. Each fumigation was of a 2-hour duration with the concentrations ranging from 0.5 to 11 ppm for SO_2 and from 0.1 to 5 ppm for NO_2. No synergistic effects were determined.[1]

Exposure of tobacco plants to a combination of 0.10 ppm ozone and 0.50 ppm sulfur dioxide for 3 hours resulted in greater leaf damage than exposure to either gas alone.[16] Other investigations with garden crops showed that minor concentrations of 0.10 ppm ozone and 0.10 ppm sulfur dioxide caused damage.[17]

Ozone levels at the Salt Wash site were measured as less than 0.07 ppm (Section 2.1.4) which compares to other measurements in remote parts of the world (0.01 to 0.05 ppm).[18] Ozone levels are too low to produce measurable synergistic effects when interacting with sulfur dioxide at present levels or at the expected levels when the power plant is operating.

Several key locations have been designated as areas with the greatest potential for receiving the maximum concentrations previously identified at various times of the year (Section 3.1.4). Based on expected concentrations of emissions from the power plant, the biological systems of these areas will not be impacted.

3.1.2.2.2 SALT WASH AREA

The Salt Wash area consists of approximately 50,000 acres (the area within 5 miles distance of the power plant but excluding areas directly affected by plant facilities) has basically two ecologically distinct areas--the dry and sparsely vegetated upland desert habitat (approximately 49,150 acres) and the riparian related habitat which occurs at Caine Springs and along Salt Wash (approximately 850 acres). Ecological effects on dry upland desert areas from power plant construction and operation should not be significant. Many of the wildlife species which